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(54) Title: EXPRESSION OF <i>ALFIN1</i> AND METHODS FOR PRODUCING TRANSGENIC PLANTS HAVING INCREASED ROOT GROWTH AND ROOT SPECIFIC GENE ACTIVATION (57) Abstract <p><i>Alfin1</i> cDNA encodes a putative transcription factor associated with salt tolerance in alfalfa (<i>Medicago sativa</i> L.). The recombinant protein binds DNA in a sequence specific manner, including promoter fragments of the salt inducible gene <i>MsPRP2</i>. <i>Alfin1</i> function was tested in transgenic alfalfa under the control of the 35S promoter in the sense and antisense orientations with the endogenous <i>MsPRP2</i> as a reporter gene. Calli overexpressing <i>Alfin1</i> were more resistant to growth inhibition by 171 mM NaCl than vector transformed controls, while calli expressing <i>Alfin1</i> antisense were more sensitive to salt inhibition. Transgenic plants overexpressing <i>Alfin1</i> in the sense orientation grew well. In contrast, the antisense transgenic plants grew poorly in soil, demonstrating that <i>Alfin1</i> expression is essential for normal plant development. Transgenic calli and plant roots overexpressing <i>Alfin1</i> showed enhanced levels of endogenous <i>MsPRP2</i> mRNA accumulation. However, <i>MsPRP2</i> mRNA accumulation was also regulated in a tissue specific manner as shown in leaves of transgenics overexpressing <i>Alfin1</i>. These results suggest that <i>Alfin1</i> acts as a transcriptional regulator in plants and <i>MsPRP2</i> expression in alfalfa. <i>Alfin1</i> overexpressing transgenics showed salinity tolerance comparable to one of our salt-tolerant plants, indicating that <i>Alfin1</i> also functions in gene regulation in salt tolerance.</p>		

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